

Using the FRITSCH PULVERISETTE 0 for RoHS tests

Regarding RoHS milling instruments, TMC, our partner in Korea supplied FRITSCH instruments to numerous customers and became the leading company in Korea in this field.

RoHS stands for "Restriction of Hazardous Substances". It is the European Union (EU) directive that restricts the use of six hazardous substances in electronic components shipped into Europe. The directive took effect on July 1, 2006. The RoHS directive requires that manufacturers be able to demonstrate that maximum levels of the following identified substances are not exceeded:

- Lead (Pb) - 0.1% PPM
- Hexavalent chromium (Cr6+) - 0.1% PPM
- Mercury (Hg) - 0.1% PPM
- PolyBrominated Biphenyl (PBB) - 0.1% PPM
- Cadmium (Cd) - 0.01% PPM
- PolyBrominated Diphenyl Ether (PBDE) - 0.1% PPM

These substances are a risk to human health. They are a health hazard when disposed of and to those who dispose them. Manufacturers must prove that these upper bounds are not exceeded. Therefore a sample preparation and test analysis are necessary.

Bulk Materials

Toxic heavy metals (Pb, Cd, Hg, Cr6+) occur in plastics, rubber, leather, certain compound materials, polish materials, Nd-Fe-B Magnets for electronic components, solder pastes, relays, rectifiers, electric sensors, connectors, temperature sensors, organic EL, Fe base tinning lead wire, Cu base tinning lead wire, paper warp compound, ink, manganese batteries, alkali batteries, Ni-Cd batteries, switches, fuses, backlight, Hg-lamps, Na-lamps, metal halogens, light bulbs.

PBBs and PBDEs occur in plastics (insoluble solvents like PP, soluble solvents like ABS), rubber (possible cold crush), silicon rubber (impossible cold crush), connectors, cable lags, motor-operated panels, printed boards (PCB) and EMC (epoxy moulding compound), switches, fuses.

Configuration

Our agent, TMC is selling an extraordinary number of **Vibratory Sieve Shakers ANALYSETTE 3 PRO** using it as a **Vibratory Micro Mill PULVERISETTE 0**. Naturally our PULVERISETTE 0 can also be used with the **Vibratory Sieve Shaker ANALYSETTE 3 SPARTAN** for this application, but the storing function (program key) of the PRO version is advantageous to comminute various samples conveniently.

Most units are delivered together with:

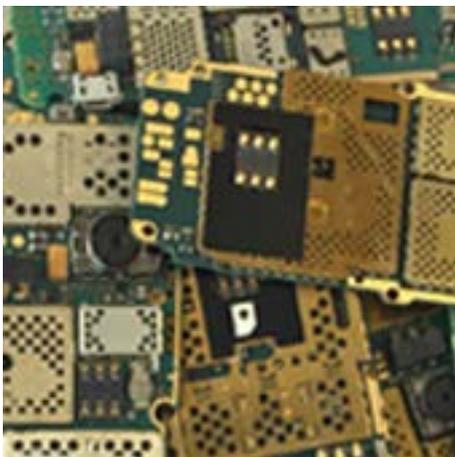
- Mortar, hardmetal tungsten carbide
- Grinding ball, hardmetal tungsten carbide
- Cryo-box
- Clamping Lid

Some units are also delivered together with zirconium oxide ZrO_2 grinding sets. Sometimes a **Variable-Speed Rotor Mill PULVERISETTE 14 classic line** also is included.

Application and Milling Examples

A lot of samples (except plastics) can be milled at room temperature by embrittlement (no cooling with liquid nitrogen). For example: PCB, IC chip, LCD glass, electronic parts, etc. Plastics are milled with liquid nitrogen in freezing conditions by embrittlement. It is possible to mill large samples easily broken (glass, electronic chip, etc.). Various materials of bowl and ball (hardmetal tungsten carbide - WC, zirconium oxide - ZrO_2 , agate - SiO_2 , sintered corundum - Al_2O_3 , etc.) enable milling without contamination of heavy metal as directed by RoHS (stainless steel has >12% Cr).

Therefore some customers are using zirconium oxide ZrO_2 grinding sets. The mortar is easily cleaned. There is little noise and vibration with the utilization of the special sound absorption hood. Please refer to the before (on the left) and after (on the right) pictures of application examples below:



Mobile phone PCB



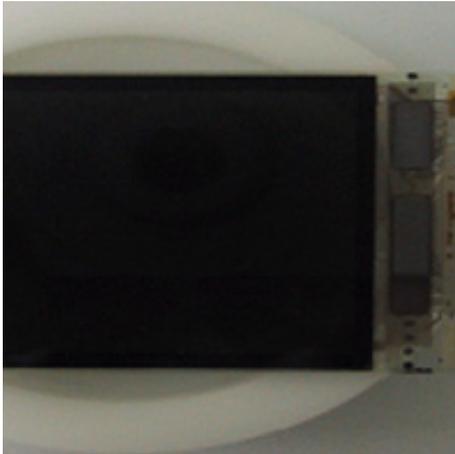
milled at room temperature



Mobile phone camera



milled at room temperature



Mobile phone LCD glass



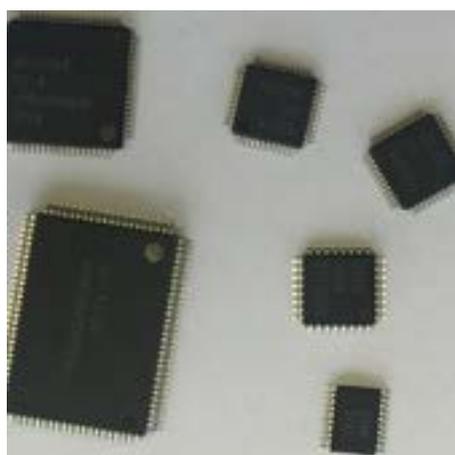
milled at room temperature



Mobile phone keypad



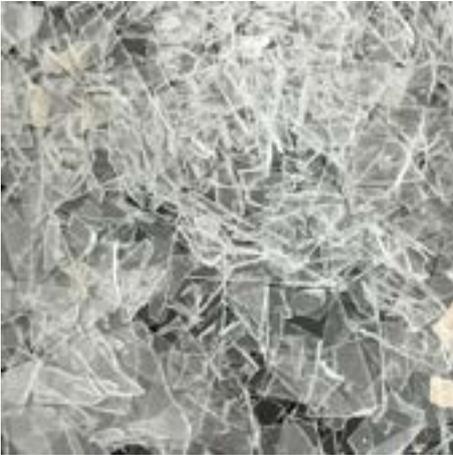
in freezing condition by embrittlement



Electronic chips



milled at room temperature



Diffusion plate LCD



milled at room temperature

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